56/56 = 100

Math 0099
University of North Georgia
Spring 2015
Exam #2

Name: Key Date: April 3, 2015

1. **Find the x and y *Intercepts* and state the *Domain* of the following: $5x - 3y = -15$. Note: Do <u>NOT</u> graph.**

x Int.: $(-3, 0)$

$5x - 3(0) = -15$

$5x = -15$

$x = -3$

y Int.: $(0, 5)$

$5(0) - 3y = -15$

$-3y = -15$

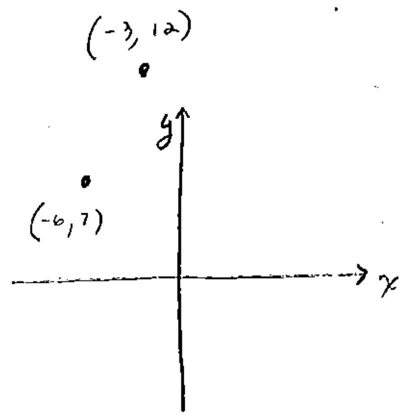
$y = 5$

Domain: $(-\infty, \infty)$

2. **Given the ordered pair (-6, 7) and a slope (m) of $\frac{5}{3}$, find another ordered pair on the same line.**

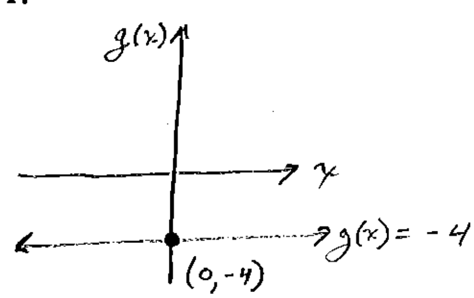
$(-6+3, 7+5)$

$= (-3, 12)$



3. **Graph and state the Domain of $g(x) = -4$.**

Domain: $(-\infty, \infty)$



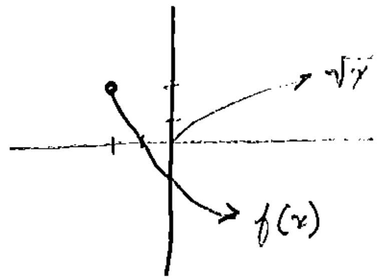
4. **Graph and state the domain of the following square root function:**

$f(x) = -\sqrt{x+2} + 2$

Domain: $[-2, \infty)$ $h = -2$, $k = 2$

$x + 2 \geq 0$

$x \geq -2$



5. **Find the domain of the given function Algebraically:**

$g(x) = \sqrt{-7x - 8}$

$-7x - 8 \geq 0$

$-7x \geq 8$

$x \leq -\frac{8}{7}$

$\boxed{\left(-\infty, -\frac{8}{7}\right]}$

Simplify using the properties of exponents.

6. $\left(10^{\frac{2}{3}}\right)\left(10^{\frac{1}{9}}\right)$

$10^{\frac{2}{3} + \frac{1}{9}}$ $\frac{2}{3} + \frac{1}{9} = \frac{6+1}{9} = \frac{7}{9}$

$\boxed{10^{7/9}}$

7. $(x^2y)^{\frac{1}{4}} x^{\frac{2}{3}} y^{-\frac{3}{8}}$

$x^{1/2} y^{1/4} x^{2/3} y^{-3/8}$

$x^{\frac{1}{2} + \frac{2}{3}}$ $\frac{1}{2} + \frac{2}{3} = \frac{3+4}{6} = \frac{7}{6}$ $\cdot$ $y^{\frac{1}{4} + \left(-\frac{3}{8}\right)}$ $\frac{1}{4} + \left(-\frac{3}{8}\right) = \frac{2 + (-3)}{8} = -\frac{1}{8}$

$\boxed{\dfrac{x^{6/7}}{y^{1/8}}}$

8. $\dfrac{t^{-\frac{5}{7}}}{t^{-\frac{4}{9}}}$

$$\frac{\frac{1}{t^{5/7}}}{\frac{1}{t^{4/9}}} = \frac{1}{t^{5/7}} \cdot \frac{t^{4/9}}{1} = t^{\frac{4}{9}-\frac{5}{7}} \qquad \frac{4}{9}-\frac{5}{7} = \frac{28-45}{63}$$

$$= t^{-\frac{17}{63}}$$

$$= \boxed{\frac{1}{t^{17/63}}}$$

Simplify using rational exponents

9. $\sqrt[12]{a^3 b^9}$

$$a^{3/12} \cdot b^{9/12} = a^{1/4} \cdot b^{3/4}$$

$$= \boxed{\sqrt[4]{a b^3}}$$

Simplify

10. $\dfrac{\sqrt{28x^3}}{\sqrt{7x}}$

$$\sqrt{\frac{28x^3}{7x}} = \sqrt{4x^2} = \boxed{2x}$$

Rationalize the Denominator

11. $\dfrac{\sqrt{a}}{\sqrt{b}-\sqrt{a}} \cdot \dfrac{\sqrt{b}+\sqrt{a}}{\sqrt{b}+\sqrt{a}} = \boxed{\dfrac{\sqrt{ab}+a}{b-a}}$

Add

12. $x\sqrt{16x} + \sqrt{9x^3}$

$4x\sqrt{x} + 3x\sqrt{x}$

$\boxed{7x\sqrt{x}}$

Solve

13. $\sqrt{6x} = -7$

Check

$6x = 49$

$x = \frac{49}{6}$

No Solution

$\sqrt{6\left(\frac{49}{6}\right)} = -7$

$\sqrt{49} = -7$

$7 \neq -7$

14. $\sqrt{9+x} = x+3$

$9 + x = x^2 + 6x + 9$

$0 = x^2 + 5x$

$0 = x(x+5)$

(1) $\boxed{x = 0}$

(2) $\cancel{\boxed{x = -5}}$

Checks

$x = 0$

$\sqrt{9+0} = 0 + 3$

$\sqrt{9} = 3$

$3 = 3$ ✓

$\sqrt{9+(-5)} = (-5) + 3$

$\sqrt{4} = -2$

$2 \neq -2$

BONUS (5 Points).

It's perfect kite-flying weather today! Gunnar grabs his kite, climbs up on the roof of his apartment, and begins playing out the kite string. In 10 seconds, Gunnar's kite is 125 feet above the ground. After 30 seconds, it is 225 feet above the ground. Assume that the height *h* of the kite above the ground is a linear function of the amount of time *t* that has passed since Gunnar began playing out the kite string.

(10 sec., 125 ft) & (30 sec., 225 ft)

$$m = \frac{225 - 125}{30 - 10} = \frac{100}{20} = \frac{5 \text{ ft}}{1 \text{ sec.}}$$

$$125 = 5(10) + b$$
$$= 50 + b$$
$$75 = b$$

$$h = 5t + 75$$

a.) Determine the height of the kite after 40 seconds. (2 pts.)

$$h = 5(40) + 75$$
$$= 200 + 75$$
$$\boxed{h = 275 \text{ ft}}$$

b.) Determine the height of Gunnar's apartment. (2 pts.)

$$h = 5(0 \text{ sec.}) + 75$$
$$\boxed{h = 75 \text{ ft}}$$